

# Of weeds and other introduced species: Ferdinand Mueller and plant and animal acclimatisation in colonial Victoria

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## Abstract

Prompted by nostalgia and economic hopes, but without an ecological understanding of the world, Ferdinand Mueller and other Europeans sought to 'improve' the Colony of Victoria by introducing useful and attractive species. As Government Botanist (1853-96), Mueller introduced an enormous diversity of foreign plants for cultivation and naturalization, and, while Director of Melbourne's Botanic Garden (1857-73), tested their colonial viability. From 1858 to 1861 Mueller was the honorary secretary of a management committee for a collection of birds and animals resident in the Botanic Garden; and, for the following twelve years, vice-president of a society which grew out of that committee – the Acclimatisation Society of Victoria, which was devoted to the introduction of species with economic and aesthetic appeal. Even after losing the Botanic Garden, Mueller continued to publicise and popularise the introduction of desirable plants, meanwhile providing weed information and advice. (*The Victorian Naturalist* 124 (2), 2007, 69-78)

## Introduction

At a time of confident geographic, economic and scientific understanding of the world's flora and fauna, Europeans introduced 'new' animals and plants into the British colony of Victoria.

In the nineteenth century, Europeans depended on natural products to satisfy their needs, and saw the world as a collection of continents, islands and seas harbouring the plants and animals which would provide their foods, medicines, fibres and timbers. Europeans explored and exploited the world. They pilfered a remarkable array of organisms, and developed and refined taxonomic systems to classify them. They established colonial botanical gardens to trial the cultivation of plants with economic potential, often in regions with climates very different from that of the imperial power. As European tastes and technologies expanded to value and process an increasing diversity of the world's flora and fauna, oceans were criss-crossed with shiploads of species destined for new landscapes. By the mid-nineteenth century a taxonomic system provided a universal lexicon of plant names and a framework within which new species could be established, and the term 'habitat' was understood in the proto-ecological context of phytogeography.

When post-Enlightenment European minds met post-Gondwanan Australian

landscapes, the human manipulation of these landscapes over many millennia and their evolution across unimaginable eras remained unseen. Europeans saw peculiar plants and animals which challenged their concepts and taxonomic systems. They also saw the young antipodean colony of Victoria as sadly deficient in useful and attractive creatures, and rose to the laudable challenge to 'improve' it with introductions of the world's floral and faunal treasures. And they harboured a gnawing nostalgia for the sights and sounds of 'home'. Furthermore, as waves of job-seeking immigrants left depleted gold-fields in the late 1850s, Victoria's government and swollen populace were anxious to find new industries. What 'new' animal or plant could graze or grow in the growing colony? A scientific society, the Philosophical Institute of Victoria, and the Government Botanist and sometime Botanic Garden Director would help.

## Plants

Dr Ferdinand (later Baron von) Mueller was Victoria's Government Botanist for most of the second half of the nineteenth century – from 1853 until his death in 1896. From 1857 until his directorship was abolished in 1873, he was also, with no additional salary, Director of Melbourne's

Botanic Garden.

Dr Mueller soon expressed his optimistic vision for Victoria's future prospects, concluding his second annual report as Government Botanist that, with 'the serene climate', 'no praise too high' could be bestowed 'on the productiveness of our adopted country'.

We possess in the Southern hemisphere, what the Ancients in the Northern called "regiones felices," those happy latitudes of a warm temperate zone, in which Nature with a prodigal hand offered prominently, amidst so many other gifts, the Cerealia, the Olive, and the Vine, and to which we there have added from the far East, the Orange, the Tea; from India, the Rice; and from the New World, the Maize, Cassava, Arrowroot, Tobacco, and so many other treasures of the vegetable world, on which mankind now rely for luxury and support. All these may be here successfully produced along with those which we enjoyed in the country of our youth, and will, I trust, with the mighty resources of our mineral wealth, render this country one of the most delightful and prosperous of the globe (Mueller 1854: 7).

As he later explained:

In all zones, except the most icy, mankind depends on plants for its principal wants. For our sustenance, clothing, dwellings, or utensils; for our means of transit, whether by sea or land; indeed, for all our daily requirements, we have to draw the material largely – and often solely – from the vegetable world. ...

To render, therefore, these vegetable treasures accessible to our fullest benefit, not only locally but universally, must ever be an object of the deepest significance (Mueller 1871b: 58).

Mueller devoted much of his working life to encouraging and facilitating the introduction of the world's vegetable treasures into Victoria, presenting his ideas about desirable plants in lectures and reports. In a public lecture in 1870, he described his species-enriched vision splendid of Victoria's mountain valleys:

Might not the true Tulip tree, and the large Magnolias of the Mississippi and Himalaya, tower far over the Fern trees of these valleys, and widely overshadow our arborescent Labiatae? Might not the Andine Wax Palm, the Wettinias, the Gingerbread Palm, the

Jubaea, the Nicau, the northern Sabals, the Date, the Chinese Fan-palms, and *Rhapis flabelliformis*, be associated with our [*Livistona*] Palm in a glorious picture? Or turning to still more utilitarian objects, would not the Cork tree, the Red Cedar, the Camphor tree, the Walnuts and Hickories of North America, grow in these rich, humid dales, with very much greater celerity than even with all our tending in less genial spots? Could not, of 400 coniferous trees and 300 sorts of oaks, nearly every one be naturalised in these ranges, and thus deals [planks], select tanning material, cork, pitch, turpentine, and many other products, be gained far more readily there than elsewhere in Victoria, from sources rendered our own?

He affirmed that

of about 10,000 kinds of trees, which probably constitute the forests of the globe, at least 3000 would live and thrive in these mountains of ours; many of them destined to live through centuries, perhaps not a few through twice a thousand years, as great historic monuments (Mueller 1871b: 60-1).

A month after his August 1857 appointment as Director of Melbourne's Botanic Garden, Dr Mueller addressed Victoria's respected Philosophical Institute on the subject of desirable plant introductions. In response to numerous inquiries, he wished 'to draw attention to some of the most useful plants deserving either introduction into this country or a wider diffusion throughout our territory', and discussed an enormous number of trees and other plants from the subtropical and colder girdles of the globe. Since 'a large proportion of our population is returning gradually from a migratory life [gold-seeking] to the firm abodes of settled communities,' he suggested that 'the time has arrived, when our thoughts should be directed, not only to the means of our present, but also of our future prosperity' (Mueller 1858a: 93).

The Botanic Garden was an essential accessory for the Government Botanist. He needed it to test the ability of plants to grow in Victoria, and to propagate plants and collect seeds for distribution across the Colony. Mueller's first annual report as Government Botanist records the Garden's importance 'for the experimental introduction of foreign plants into our adopted

country' (Mueller 1853: 7). The German-born discipline of phytogeography, which sought explanations for the climatic shaping of the world's vegetation, underpinned Mueller's understanding of the essential role of a botanic garden as a place to test-cultivate plants from similar climatic zones (Jeffries 1997), and led him to seek (unsuccessfully) experimental gardens in other climatic regions of Victoria (Home *et al.* 2002: 333-4, 405, 628). His first report as Director of the Botanic Garden concludes:

when it is considered that under the mildness of our climate we may choose from the endless number of plants of the whole temperate and subtropical zone, and that even many from the warmest parts of the globe may be acclimatized in our latitudes, it will then be needless to show how wide a field is left for our progress, and we may trust that many of the future introductions into our Garden will not be without practical value to the Colony (Mueller 1857: 8).

Mueller's annual reports include long lists of seed and plant donors, thirty botanic gardens and over 150 individual donors being recorded for 1860 (Mueller 1861: 3-4).

Mueller sought all manner of useful plants to test their suitability for colonial cultivation or naturalization. Some of those he mentioned in his substantial Philosophical Institute paper were already growing in the Botanic Garden. His annual report for 1858 records the following eclectic collection:

various Spice plants, the Tallow tree, the Nettle tree of Illawarra, the Desert Clianthus (which was figured as a notable flower already by Capt. Dampier), the Bottle tree of Sir Thomas Mitchell, the Litchi tree, the Cherimoir, the Banyan tree, the tall Pampas grass, the prolific Prairie Festuca, the edible Hovenia, the Gunyang, the Staranis, the Paraguay and Chinese Tea, the Camphor tree, the Tulip tree, Waratah, Bananas, the American Sarsaparilla, the Cork tree, the Giant Pine of California, the Cochineal Cactus, the Chinese Grass-cloth plant, the Australian and Indian Rotang, the Coffee tree, the Cotton plant (which now without protection occasionally ripens its pods), the Red Cedar, the Kaurie Pines from East Australia, Polynesia, and New Zealand, Bog Bean, Acorus, Nelumbium or Sacred

Pythagorean Bean, many medicinal plants, &c (Mueller 1858b: 7).

These and other useful plants are among the 3300 species listed in the 'Catalogue of plants under cultivation in the Melbourne Botanic Garden' which Mueller appended to his 1858 report.

During his sixteen years as Director, Mueller oversaw the cultivation of many thousands of plant species in Melbourne's Botanic Garden. His aim was always

to give precedence to *utilitarian and industrial culture*, while less attention was bestowed on mere ornamental cultivation ...

I kept the requirements of a *young country* in view, where the extensive distribution of new industrial plants, such as Cork Oaks, American nut trees, Assam and Chinese tea &c, is needed far in preference to the ephemeral show of florist flowers (Home *et al.* 2002: 517).

In the 1860s visitors to the Botanic Garden could see all sorts of medicinal, food and fibre plants, and, in the Garden and the adjacent Government House Reserve, enjoy the umbrageous beauty of avenues and plantations of an impressive diversity of coniferous and deciduous timber trees.

### Animals

Under Mueller the Botanic Garden contained more than plants. Initially there were birds on the lagoon and in the shrubbery (Mueller 1857: 8). Then an aviary was added, prompted by an Institute talk by Edward Wilson, gentleman farmer and co-owner and retired editor of Melbourne's newspaper, *The Argus*.

In April 1857, Wilson discussed his orchestration of the transfer of the Murray Cod to the Yarra River – his own small correction of the 'unequal and even eccentric' distribution of Nature's creatures. 'With a virgin country, an Italian climate, and British institutions to lend force and intelligence to our endeavours', Wilson (1857a: 24) shared Mueller's hopes for vast and varied economic and aesthetic improvements, and pointed out that

Nature seems to have been lavish in the supply of her various gifts, but singularly capricious in their adjustment; or rather she has properly and kindly left to man the interesting and agreeable task of supplementing her own efforts, of discovering by experi-

ment and the action of his own intellect how far the gift itself may be multiplied, extended and improved (Wilson 1857a: 25).

In a subsequent Institute paper on the introduction of such welcome British song-birds as canaries, skylarks and nightingales, Wilson (1857b: 86) explained that he had 'no idea of living in a half-furnished country'. His talk prompted the formation of the Institute's Song Bird Committee (which included Wilson) to consider future symphonic introductions. Following Mueller's recommendation, the Committee's request for government funds for the erection of an aviary in the Botanic Garden was successful (Maroske and Gilfedder 1994). Meanwhile, Wilson became a founding committee-member of the new Zoological Society of Victoria, which was established in October 1857, and sailed for England, where he began orchestrating the transmission of birds to Melbourne.

Early aviary residents included canaries, goldfinches, chaffinches, siskins, linnets, Java sparrows, nightingales, skylarks, blackbirds, thrushes, Manilla doves, partridges, larks, starlings, hedge sparrows, Fiji pigeons, ring doves, ortolans, Ceylon doves, turtledoves – many sent by Edward Wilson (Maroske and Gilfedder 1994). The purpose was more than display. Birds were to be liberated in the Botanic Garden and beyond. In September 1858 Mueller informed the Philosophical Institute that 'the birds are mostly prospering, and there are many young canaries'. With a view to setting loose a large number of birds for naturalisation, he besought Institute members and their friends for donations of female goldfinches and linnets, and also thrushes, blackbirds and nightingales (Philosophical Institute of Victoria 1858).

Mueller reported that the aviary (Fig. 1), which had 'become very attractive to the public', was 'placed in the dense shrubbery of the valley between the rustic bridge and the lake, in order that the sight and song of the birds may be fully enjoyed without disturbing them'. It housed a large number of birds 'entrusted to our care by the Philosophic[al] Institute, with a view of effecting the domiciliation of the young birds in our garden, and thereby gradually a general distribution of foreign song birds over Australia' (Mueller 1858b: 4). A sec-

ond wing was added during 1859, 'the whole dry and shady space below the bridge thereby becoming available as a secluded spot for brooding birds' (Mueller 1860a: 3). Unfortunately a trial sanctioned by the Institute's Committee 'to naturalize foreign singing birds, by setting them at liberty in our shrubberies' was not successful. Gradually,

although well provided with food, the number of the liberated birds decreased, and at last they entirely disappeared. In an attempt to naturalize the more hardy thrushes [from Wilson], we may anticipate to be more successful, particularly if at the proper season, the birds are at once transferred to suitable spots in the forest ranges, or perhaps to some of the islands (Mueller 1860a: 8).

Although many birds suffered badly during the long sea voyage to Melbourne, ornithological expectations and experiments continued. During 1860 many pairs were liberated 'near the Yarra Bend Asylum, on Phillip Island, Sandstone Island, and Churchill Island', as well as in the Botanic Garden, or 'distributed to gentlemen who had constructed aviaries sufficiently spacious and secure to render the prospect of the increase of these birds rather hopeful' (Mueller 1861: 9).

Meanwhile the Philosophical Institute agreed to hand over its incoming birds to the young Zoological Society, which, without promised government funds, was unable to develop its own rather swampy grounds on the northern (Richmond) side of the Yarra River, leaving its small, but growing, menagerie accommodated in the aviary and an enclosure in the Botanic Garden on the other side of the Yarra. Ferdinand Mueller and Frederick McCoy, Professor of Natural Science at Melbourne's young University, were two of the four government nominees on the committee established in mid-1858 to manage the impecunious Society's creatures – the Zoological Gardens Management Committee, which received the £3,000 earlier promised to the Zoological Society (Gillbank 1996a; 1996b). As the Committee's Honorary Secretary from 1858 to 1861, Dr Mueller sought useful animals and, as Botanic Garden Director, continued to seek, grow and distribute useful plants.



Fig. 1. The aviary in Melbourne's Botanic Garden, photographed by Ed Haigh in 1861. Picture Collection, State Library of Victoria.

When the Zoological Society's land was incorporated into the Botanic Garden, Mueller could sign his annual report as Government Botanist and Director of the Botanic and Zoological Garden. By 1860 the mainly donated exotic faunal residents included llamas, Angora goats, fat-tail sheep, elk, fallow deer, Sumatra deer, Ceylon deer, four species of monkey and English squirrels, as well as various waterbirds and songbirds (Mueller 1861: 10). The arrival of 46 thrushes and llamas (in a mixed llama-alpaca flock) from Edward Wilson, prompted Mueller to report that the disinterested zeal, the circumspect care, and patient perseverance of that gentleman, for the introduction of the treasures of the animal kingdom into this country, cannot receive a sufficiently high eulogium. To his exertions, supported by some friends of the colonies in Britain, we owe principally the donation of our llama-alpaca flock (Mueller 1860a: 8).

In his presidential address to the Philosophical Institute (almost Royal Society) of Victoria, Mueller (1860b: 5) commended Edward Wilson's zoological zeal, and expressed his own continuing high hopes:

Might not the vegetable treasures from every zone, except the torrid, be flourishing around us, ministering to our necessary wants and to our luxurious enjoyment? Might not the pastures of our silent Alps, might not our grassless forest-ranges, like the Andes or the Himalayan mountains, yet be enlivened by the alpaca or the Cashmere goat? Might not

the desert game of Southern Africa yet roam in lively sport throughout our inland solitudes, and render them more hospitable, perhaps betraying to the wearied wanderer, by their path, the water-pool on which his life depends? Might not the camel's track across the continent guide with their flocks the harbingers of new colonization to the oases of our inland

wastes ... (Mueller 1860b:3)?

Government funds allowed the Zoological Committee to acquire expensive animals. At great government expense, two dozen camels arrived in 1860, and in August set off from Royal Park with Burke and Wills and the rest of the Royal Society's over-encumbered expedition to cross the continent – just as Royal Park was being considered as an alternative site for a menagerie (Gillbank 1996b).

Fresh from participating in the establishment of an English acclimatisation society, the eagerly-awaited Edward Wilson returned late in 1860 to a Melbourne well-set for acclimatisation, and quickly became a member of the Zoological Gardens Management Committee, which was now the provisional committee of a new society dedicated to something much grander than mere menagerie management – acclimatisation. The Acclimatisation Society of Victoria was the third such society in the world, and, like the English society, echoed the aims and aspirations of the earlier-established French society (Gillbank 1986).

### The Acclimatisation Society of Victoria (ASV)

Melbourne's new society echoed the hopes and aspirations of resident Europeans. It would seek to satisfy their economic and nostalgic desires by orchestrating the introduction of plants and animals of use and pleasure. Arising on a wave of enthusiasm for animal and plant acclimatisation, it was an organisation truly of its time, and sought

to complete the work which Nature had apparently left incomplete in Australia. It had high ideals and huge hopes.

The Acclimatisation Society of Victoria (ASV) was formally established at a public meeting presided over by Victoria's governor, Sir Henry Barkly, on 25<sup>th</sup> February 1861. With Henry Barkly as Patron and Edward Wilson President, Ferdinand Mueller was Vice-President, a position he held from 1861 to 1872. The ASV attracted members, and funding and land from a government willing to continue supporting the zoological enterprise. Angora goats, Chinese sheep, llamas and alpacas were transferred to the patch of Royal Park permanently reserved for zoological purposes, to become the nucleus of the ASV's zoological collection, leaving birds singing in the aviary and swimming on the lagoon in the Botanic Garden. To the dismay of many Melbournians, the main purpose of the ASV's zoological gardens was not the display of animals. Instead they were a staging depot where sea-weary animals could rest and hopefully breed, while awaiting transfer to a rural property or liberation in the wild (Gillbank 1996a; 1996b).

With its council including scientists, doctors, lawyers, newspapermen and wealthy farmers and pastoralists, the ASV exuded influence; and sister societies were established in other Australasian colonies (Gillbank 1986). In its first annual report, the ASV Council expressed gratitude for 'the liberality of the Legislature' and confidence that continuing government support would result in

the aggrandisement of the colony, and the multiplication of its industrial resources, while its attractions as a place of residence will be materially enhanced when it offers to the lover of nature and the sportsman the same sources of pastime and enjoyment with which he was familiar in the country from which he emigrated ... No country in the world is so favourably circumstanced for acclimatisation purposes as Victoria, and it is within the power of its inhabitants to enrich it by stocking its broad territory with the choicest products of the animal kingdom borrowed from every temperate region on the face of the globe (Acclimatisation Society of Victoria 1862: 9).

The ASV tried to please everyone. For the pastoralist it offered the alpaca, Angora and Cashmere goat; for the sportsman deer, elk, hare, quail and various ducks; for the angler salmon, trout, carp and other fish; and for the agriculturalist, such supposedly grub-eating birds as the thrush, blackbird, starling, sparrow and Common (Indian) Myna.

Professor Frederick McCoy, delivered the ASV's first anniversary address in November 1862, explaining that acclimatisation was

*the bringing together in any one country the various useful or ornamental animals of other countries having the same or nearly the same climate and general conditions of surface (McCoy 1862: 36).*

He had a gastronomic slant on biodiversity, and particularly valued those cud-chewing, hooved quadrupeds, the ruminants, which include sheep, goats, cattle, deer and antelopes. Explaining their meat-producing importance, Professor McCoy revealed the 'extraordinary' fact that

while Nature has so abundantly furnished forth the natural larder of every other similarly situated country on the face of the earth with a great variety, and a profusion of individuals of ruminants good for food, *not one single creature of the kind inhabits Australia!*

Furthermore,

If Australia had been colonised by any of the lazy nations of the earth, this nakedness of the land would have been indeed an oppressive misfortune, but Englishmen love a good piece of voluntary hard work, and you will all, I am sure, rejoice with me that this great piece of nature's work has been left to us to do (McCoy 1862: 39).

He mentioned arrangements for the acquisition of the highly-prized eland and other South African antelopes, and the anticipated arrival of a flock of the valuable 'pure Cashmere-shawl goat, from Thibet', purchased by the ASV

with the intention of forming a great herd on some of the highest mountains of Gipps Land which retain snow sufficiently long to produce the temperature necessary for preservation of the finest qualities of the wool and hair' (McCoy 1862: 50).

In the 1860s Professor McCoy helped the ASV introduce the Cashmere goat and two

other creatures from India – the Arrindy silkworm and the Indian Myna. While Dr Mueller continued to distribute white mulberry trees, which the ASV hoped would eventually support a silk industry, the introduction of the Arrindy silkworm, which lives on the castor oil plant, was unsuccessful. The ASV had the supposedly grub-consuming Indian Myna and other ‘precious’ introduced birds given legal protection from shooting (by listing them under Victoria’s game act). Farmers, however, did not appreciate their fruit-consuming propensities, and, despite McCoy’s continuing praise of their grub-eradication value, the ASV decided not to oppose the removal of sparrows and mynas from legislative protection in 1871 (Gillbank 2001).

By then public criticism of Melbourne’s Botanic and Zoological Gardens was escalating. The Botanic Garden was not beautiful enough. The ASV’s menagerie was not exciting enough. In a public lecture in 1871 Mueller discussed the importance of a botanic garden in bringing together ‘the greatest possible number of select plants from all the different parts of the globe’ and their scientific, geographic and economic display. By ‘the introduction of novel utilitarian species, local industries are to be extended, or new resources to be originated’, and public interest generated in the utilisation of plants and their products (Mueller 1872a: 6). But this was apparently not what the public wanted. Just as Baron Ferdinand von Mueller was being ousted from his too scientific and instructive Botanic Garden (Cohn and Maroske 1996), the ASV acknowledged its zoo-keeping role and became the Zoological and Acclimatisation Society of Victoria and began seeking more interesting animals for its Zoological Gardens.

Nevertheless the Society published Mueller’s papers on timber trees and other plants ‘readily eligible for Victorian industrial culture, with indications of their native countries and some of their uses’ (Mueller 1871a, 1872b, 1874, 1875, 1878), which he prepared ‘with a view of promoting the introduction and diffusion of the very many kinds of plants, which in our geographical latitudes may be extensively reared in forests, on fields or pasture’

(Mueller 1876: iii). Seeking a wider audience for this important information, he gained ministerial approval for a departmental publication – his 293-page book, *Select plants readily eligible for industrial culture or naturalisation in Victoria, with indications of their native countries and some of their uses* (1876), in which he sought to bring together ‘some condensed notes in popular language on all the principal utilitarian plants hitherto known to prosper in extra-tropic zones’ (Mueller 1876: iii). Since the information was relevant to other temperate parts of the world, Mueller removed ‘Victoria’ from the title and added ‘extra-tropical’, and edited and enlarged it for NSW, Indian, American, German, French and Victorian editions in the 1880s. The 1885 Victorian edition of *Select extra-tropical plants* contains 466 pages of information about useful alien and Australian plants. Not surprisingly, it does not include thistles and other acknowledged weeds.

#### Weeds

Mueller was affronted by the accusation that he had introduced weeds into Victoria. Certainly Capeweed *Arctotheca calendula* (= *Cryptostemma calendulaceum*) was a glaringly obvious problem in the Botanic Garden, but Mueller pointed out that, on his arrival in 1852, it was already widely established around Melbourne (Maroske 2005: 178). And he knew that it had been recognised as a Victorian weed long before that. Since he had ‘repeatedly been accused of having brought this and other weeds’ into the Colony, Mueller (1869: 10) reported that these assertions were ‘contrary to facts, and that already, in 1833, Baron Von Huegel noticed and recorded the cryptostemma as an inextermible weed of Australia’. In a public lecture, he mentioned the ‘Cape Weed, for the presence of which I am not responsible, as it had already irrepressively invaded some parts of Australia as early as 1833’ (Mueller 1872a: 29). Before moving to Victoria, Mueller had observed and collected it in South Australia, recording on his herbarium specimens its common occurrence round Adelaide in 1848 (Kloot 1983: 112).

Mueller was aware of weeds as soon as he arrived in Australia. While collecting and documenting the South Australian

flora, he recognised familiar plants proliferating in disturbed areas round Adelaide and in rural farming areas – plants which, unlike Capeweed (from South Africa), were well-known weeds in Europe (Kloot 1983, 1987). Victoria's National Herbarium (MEL) holds specimens of weeds Mueller collected in various parts of South Australia in the late 1840s, some of which include annotations such as 'on roads, waste places and cultivated land around Adelaide' for Wireweed *Polygonum aviculare* (Kloot 1983: 118).

When South Australia's *Thistle Act* 1851 was passed, Mueller estimated that about 100 plant species (from Europe and the Cape of Good Hope) had become naturalised 'beyond the possibility of extirpation' in South Australia (Kloot 1983: 98). Aimed at preventing the further spread of plants commonly known as the Scotch Thistle, the Act covered purple-flowered thistles, but not the true Scotch Thistle, which was not common in South Australia (Kloot 1987: 88).

Victoria's Thistle Bill was passed in 1856, while Mueller was away on a British expedition across northern Australia. 'An Act to make provision for the eradication of certain thistle plants and the Bathurst Burr' (1856) covered four purple-flowered thistles well-known in Europe – Spotted Thistle, *Carduus Marianus*, Sacred Thistle, *Carduus Benedictus*, Spear Thistle *Carduus Lanceolatus*, and Scotch Thistle *Onopordon Acanthium*, – and the Bathurst Burr *Xanthium Spinosum*, from South America (Parsons 1973: 14). In 1861 Mueller warned that 'unless the growth of the thistles becomes methodically checked, their number will year after year be vastly increasing until it may finally [be] almost beyond possibility to arrest the progress of these weeds', and advised that the Thistle Act should be rigorously enforced on private land and tenders should be hired to deal with weeds on Crown land (Maroske 2005: 176).

When amendments to Victoria's 1865 Thistle Prevention Statute were being considered, Mueller recommended the removal of the Holy or Sacred Thistle, which had 'never been really abundant' and had 'lately almost disappeared', and the addition of the troublesome Creeping or Perennial Thistle *Carduus arvensis*, 'on account of its creeping perennial root, which is very tenacious

of life' (Home *et al.* 2002: 590-591). Mueller was aware that Wireweed (sometimes called Knot Weed), docks and other weeds were spreading but, because their seeds were neither as readily wind-dispersed as thistle-down nor as readily transported by stock as the Bathurst Burr, he would not seek their inclusion under the Act 'unless many other troublesome weeds, such as the Burr Clover *Medicago denticulata*, the South European Star Thistle *Centaurea Melitensis*, *Cryptostemma calenduloceum* and many other weeds, were also included in the operations of the act' (Home *et al.* 2002: 592). Mueller's suggestion for the addition of weeds 'deemed by the Government Botanist as sufficiently noxious to be operated against in conformity with this act' (Home *et al.* 2002: 591), was echoed in the 1891 Act, which allowed plants to be proclaimed 'thistles' without requiring an amendment (Parsons 1973: 14).

To facilitate recognition and understanding of plants whose destruction was required under the Thistle Act, Mueller (1893) prepared an illustrated booklet on the nine species

- *Carduus Marianus* Spotted Thistle
- *Carduus lanceolatus* Spear Thistle
- *Onopordon Acanthium* Scotch Thistle
- *Xanthium spinosum* Bathurst Burr
- *Carduus arvensis* Perennial Thistle
- *Carduus pycnocephalus* Shore Thistle
- *Centaurea Calcitrapa* Star Thistle
- *Centaurea Melitensis* Malta Thistle
- *Keutrophyllum lanatum* Saffron Thistle

All are listed in Mueller's 'Plants, hitherto immigrated and naturalized in Victoria, with indications of their nativity and English popular names' in his *Key to the system of Victorian plants* (1888). Mueller did not include their descriptions because most of the 171 listed naturalized aliens, being widely distributed in Europe, were described in publications on the British flora, which were readily available in Victoria. The list also includes other weeds, such as Capeweed, *Arctotheca calandula* Knot-Weed *Polygonum aviculare* Burr-Clover, *Medicago denticulata* and the docks *Rumex crispus* and *Rumex conglomeratus*.

Not all the listed naturalised aliens were undesirable weeds. Mueller (1885) described over a quarter of them in his *Select extra-tropical plants, readily eligi-*



ble for industrial culture or naturalization, including Chamomile, Parsley, Chicory, Samphire, Artichoke, Fennel, Lettuce, Horehound, Alfalfa or Lucerne, Penny-royal, Tree-Tobacco, Parsnip, Castor Oil Plant, Rosemary, Salad Burnet, Salsify, Gorse or Furze, Vetch and various clovers and grasses. The entry for Horehound *Marrubium vulgare* includes good and bad attributes – ‘in many countries quite a weed ... Its naturalization can nowhere be unwelcome, as it does not unduly spread ... The plant accommodates readily to any forlorn waste land’ (Mueller 1885: 209). It was cultivated in the Botanic Garden in the 1850s and 1860s (Mueller 1858b, Maroske pers. com.).

So were various apparently not-yet-naturalised species of *Rubus*, including several types of blackberry. The nine species recorded in the Botanic Garden in 1858 include *Rubus fruticosus*, the ordinary Bramble or Blackberry-bush (Mueller 1858b: 25). The ‘British Blackberry, which proves to be remarkably prolific,’ was among the numerous plants distributed to public institutions in 1861 (Mueller 1862: 6). In 1860 Mueller (1861: 5) welcomed the addition of the Canadian Blackberry *Rubus Canadensis* to the Botanic Garden and ‘scattered the seeds of the large-fruited Canada blackberry along the alpine springs’ on the Baw Baw plateau, later learning that ‘this delicious fruit is established on the rivulets of that mountain’ (Mueller 1871c: 38). In 1870 he told his audience ‘Disseminate the Strawberries of the countries of our childhood, naturalise the Blackberry of northern forest moors’ (Mueller 1871b: 72). In the mid-1890s *Rubus fruticosus* was not one of Victoria’s over 200 acknowledged naturalised plants (Anon 1893), and Mueller continued to claim that it ‘deserves to be naturalised on the rivulets of any ranges’ in his *Select extra-tropical plants* (1895).

As the number of, and information about, desirable species increased the size of successive editions of Mueller’s *Select extra-tropical plants*, so too did the small number of warnings about potential weeds. Warnings for ten of Mueller’s (1888) naturalized species described in the 9<sup>th</sup> edition of *Select extra-tropical plants* (1895), include that Tall Meadow-oatgrass *Avena elatior* ‘becomes easily irrepressible on

account of its wide-creeping roots’; Wild Oats *Avena fatua* is ‘hard to exterminate in grain-fields, where it sometimes proves quite troublesome’; Penny-royal *Mentha Pulegium* is ‘To be avoided on pastures, as not readily repressed’; and Gorse or Furze *Ulex Europaeus* is ‘Too apt to stray as a hedge plant’. Entries for 26 species in the 9<sup>th</sup> edition include some indication that the plant was a potential weed (Maroske 2005: Appendix U). Balancing the usefulness of plants with their possible weediness was not easy.

### In retrospect

In an era when acclimatisation was an extremely popular exercise in what today might be called biological globalisation, Mueller and other well-intentioned Europeans introduced into Victoria all sorts of useful plants and animals from climatically similar parts of the world.

With the wisdom of hindsight we may smile dismissively at those responsible for such unsuitable past introductions as the fox, sparrow, Capeweed and blackberry, which we know have become invasive weeds and pests. Many such introductions have been environmentally disastrous. But, with ideas and technologies unavailable to ecologically-unaware 19<sup>th</sup> century acclimatists, we should be careful of slick condemnations of actions and aspirations of so long ago.

No-one today would want to introduce something like the Bumble Bee. Or would they?

### Acknowledgements

I thank Sara Maroske and Helen Cohn for information and comments; and Jill Thurlow in Melbourne’s Royal Botanic Gardens library and Leanne McCredden in the University of Melbourne library for help with Mueller’s published papers and various editions of his *Select extra-tropical plants*. Species names are those used in the references cited.

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Received 28 September 2006; accepted 7 December 2006